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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,764	07/28/2006	Helerson Kemmer	3770	2112

7590
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EXAMINER

VILAKAZI, SIZO BINDA

ART UNIT	PAPER NUMBER
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4147

MAIL DATE	DELIVERY MODE
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02/11/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/587,764	Applicant(s) KEMMER, HELERSON	
	Examiner SIZO B. VILAKAZI	Art Unit 4147	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/28/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

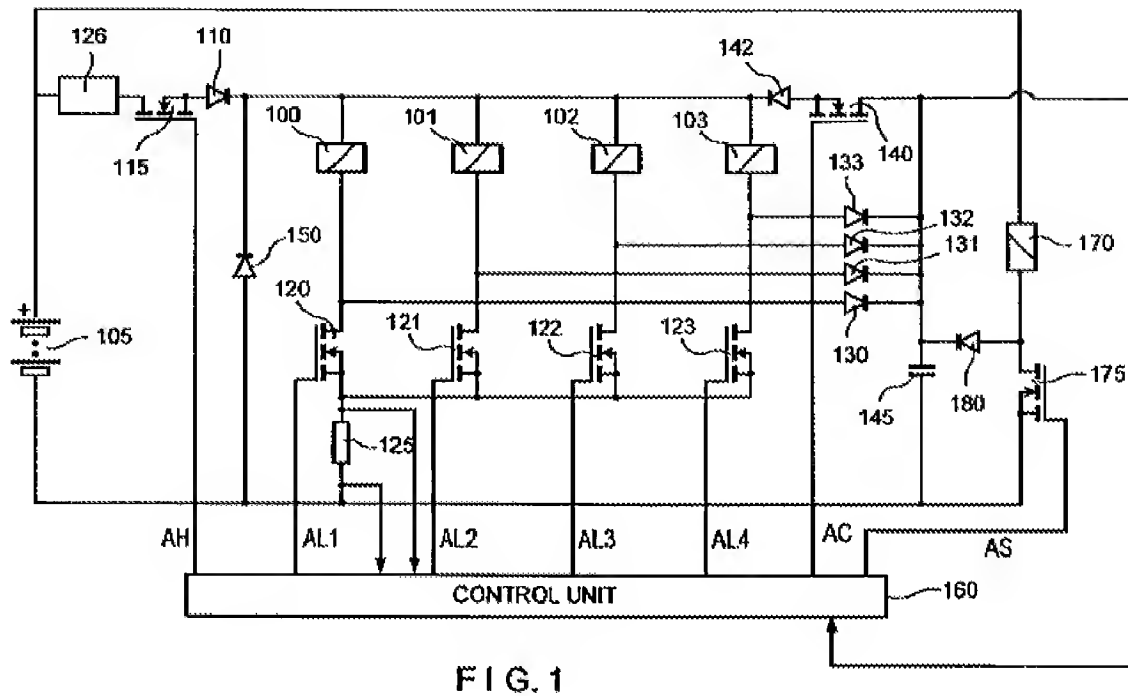
Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-6, 9, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Hoenig et al. (Patent Number 6,250,286 B1).



3. In Re claim 1, Hoenig et al disclose a method for operating an internal combustion engine with:
 - a. A fuel injector (100-103) that is opened and closed electrically (Column 2, Lines 4-5)
 - b. A booster capacitor (145) serving to increase the current intensity when the fuel injector is opened (Column 4, Lines 13-17)
 - c. A setup wherein in certain operating states of the internal combustion engine the current profile of the booster current is switched from a standard value to an increased value and/or to a longer duration and when the certain operating

state ends, it is reset to the standard value and the standard duration (Column 6, Lines 17-26 and Lines 45-50)

4. In Re claim 2, Hoenig et al. disclose method wherein during a starting procedure of the internal combustion engine, the current profile of the booster current is switched from the standard value to the increased value and/or to a longer duration, and, upon transition back to normal operation, it is reset to the standard value (Column 6, Lines 17-26 and Lines 45-50)

5. In Re claim 3, Hoenig et al. disclose a method wherein when an overrun condition ends, the current profile of the booster current is switched from the standard value to the increased value and/or to a longer duration, and, upon transition back to normal operation, it is reset to the standard value (Column 6, Lines 17-26 and Lines 45-50)

6. The applicant defines an overrun condition as a situation where the fuel injection has halted, and the fuel pressure is increased due to the fuel temperature being increased by heat transfer from the engine.

7. The method disclosed by Hoenig et al. addresses this problem by adjusting the booster current based on the magnitude of the fuel pressure, thus anticipating the claimed invention.

8. In Re claim 4, Hoenig et al. disclose a method wherein the current profile of the booster current is switched to a longer duration by applying multiple booster pulses (Column 6, Lines 26-29)

9. Hoenig et al. disclose that the time quantities defining the start and end of the injection are corrected as a function of the smaller booster voltages.

10. The correction of injection length results in a corresponding correction of the booster current length, thus anticipating the claimed invention.

11. In Re claim 5, Hoenig et al. disclose a method wherein the switch between the standard value and the increased value takes place within one injection cycle (Column 6, Lines 15-35).

12. In Re claim 6, Hoenig et al. disclose a method wherein the current profile of the booster current is switched from the increased value or the longer duration to the standard value and the standard duration when the rail pressure falls below a lower threshold (Column 6, Lines 45-50)

13. In Re claim 9, Hoenig et al. disclose an internal combustion engine with:

a. A fuel injector (100-103) that can be opened and closed electrically (Column 2, Lines 4-5)

b. A reversible booster capacitor (145) serving to increase the current intensity when the fuel injector is opened (Column 4, Lines 13-17)

c. A booster current with a current profile that is capable of being switched from a standard value to an increased value and/or to a longer duration

13. In Re claim 10, Hoenig et al. disclose an internal combustion engine wherein the booster capacitor is charged by a reload circuit (Column 5, Lines 32-48)

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 7-8 rejected under 35 U.S.C. 103(a) as being unpatentable over Hoenig et al. (Patent Number 6,250,286 B1).

16. In Re claim 7, Hoenig et al. do not disclose a method where the current profile of the booster current is switched from the increased value or the longer duration to the standard value and the standard duration when the number of injections with the increased value of the booster current exceeds a maximum value.

17. However, MPEP section 2144.05 states “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.”

18. A decrease in the profile of the booster current after multiple longer duration injections is inherent in the nature of the apparatus, as eventually the capacitor voltage can no longer support said injections.

19. The setting of a safety factor in engineering situations is a common practice, and the limitation of longer duration injections in order to prevent the capacitor from being completely drained is considered a safety factor for the system

20. Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method disclosed by Hoenig et al. in the above described manner to arrive at the current invention.

21. In Re claim 8, Hoenig et al. do not disclose a method wherein the current profile of the booster current is switched from the increased value or the longer duration to the standard value and duration as soon as the voltage of the booster capacitor falls below a lower threshold.

22. Again, a decrease in the profile of the booster current when the booster voltage decreases to a minimal value is inherent in the nature of the apparatus

23. The setting of a safety factor is commonly known practice in the art

24. Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method disclosed by Hoenig et al. in the above described manner to arrive at the current invention.

Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Reischl et al. disclose a method for triggering a solenoid valve for injecting fuel into an internal combustion engine. Yamakado et al. teach a method of operating a fuel injection system. Nasu teaches a fuel injection system and control method. Santero et al disclose a device for controlling fuel electro-injectors and electrovalves in an internal combustion engine.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SIZO B. VILAKAZI whose telephone number is (571)270-3926. The examiner can normally be reached on M- F: 9:00am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Nguyen can be reached on (571) 272-4491. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sizo B Vilakazi
Examiner
Art Unit 4147

/George Nguyen/
Supervisory Patent Examiner, Art Unit 4147